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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/243,237	02/02/1999	DEBASISH MUKHOPADHYAY	MDO-2471-D1	2221

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EXAMINER

FORTUNA, ANA M

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 06/11/2002

18

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/243,237

Applicant(s)

MUKhopadhyay

Examiner

Ana Fortuna

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Apr 24, 2002
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 37-62 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 37-62 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 17 6) ☐ Other:

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DETAILED ACTION

Claim Rejections - 35 U.S.C. § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 37-41, 41, 55, 56, are rejected under 35 U.S.C. 103(a) as being unpatentable over Collentro et al.(5,766,479 , 5,670,053). Reference '479 discloses a process treating water having the components claimed in step a), the process includes removal of hardness ions, dissolved gas, e.g. CO₂, and more than one reverse osmosis treatment stages or passes (abstract, column 5, lines 20-68, column 6, lines 55). The product obtained by the process of '479 in a first RO membrane treatment contains ionized material, e.g. silica between 0-20 ppm, and TOC is substantially removed by pretreatment, e.g. activated carbon and nanofiltration, which removes organic matter (column 5, last paragraph, and column 6, first paragraph), further removal is expected by the reverse osmosis stages treatment, the low degree of TOC can be evidence by the level of **resistivity in the ultrapure water, e.g. 10 megohm-cm** can be produced, therefore, the water produced in the second stage meets the requirement of TOC levels claimed. Reference **'479 fails to disclose the process steps** in the order and conditions claimed in the present

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invention, but the products meets the conditions of the product water or treated water as claimed including the TOC and silica levels. Reference '053 also discloses water product with the claimed TOC level, e.g. , 1 to about 5 ppm (column 8, lines 26-31, column 9, lines 24-40, column 10, lines 34-37); the source of water to be treated is also disclosed (column 5, lines 41-61). removing ionic material in a first reverse osmosis stage up to 95 % is disclosed (column 6, lines 55-65), and removal of 90 % of the remaining ions in the second reverse osmosis membrane (column 9, lines 1-17) therefore, removal of silica as claimed should have been expected to the skilled in the art. Reference '053 fails to disclosed the process including all the conditions of the claimed process of making the product water, however, teaches the product water with properties., e.g TOC and silica or ionized species level claimed, the degree of purity measured as resistivity greater than 1 also indicates the degree of purity of the produced water in the references above. Regarding claims 29 and 33 water free of virus and bacteria is produced, e.g. water meeting the USP standards (column 9, lines 24-39).

3. Claims 37-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bhave et al. (5,645,727). Reference '727 discloses the product "water" having the TOC, Silica, Boron, bacteria levels claimed (Tables II and III), virus removal is not disclosed, but since the process remove pyrogen and bacteria by reverse osmosis and other polishing steps, virus is also expected to be remove. Reference '727 fails to disclose the process steps for producing water, but discloses the water with the claimed purity. Since product by process claims are product, the rejection is proper. Water product having a resistivity (degree of purity of the ultrapure water)

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of 18.2 M ohm/cm at 25 degree C is also disclosed (Table II, column 17), the boron, TOC and silica of the produced water is also disclosed (column 15, lines 23-34, column 16, lines 1-34, and Table III, column 17, lines 1-44).

4. Claims 37-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (5,573,662).

Reference '662 discloses product water with the level of TOC as in the product of the claims above (column 7, Table). The process including the claimed steps for producing the water are not disclosed, however, treating the water by reverse osmosis unit, which removes alkalinity and hardness ions, vacuum deaeration to remove gases, ion exchange, and ultraviolet as water refining steps are disclosed. Therefore, although the process including pH adjustment is not disclosed, producing water having the TOC level claimed is disclosed by '662 (column 3, lines 53).

Additional removal of other contaminants should have been expected by the skilled in the art at the time the invention was made based on the membrane treatment and posttreatment of the water.

5. Claims 37-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tao et al. (5,250,185). Reference '185 discloses a product water containing 1.2 % of boron (column 7, lines 38-47). The process for producing the product water includes pretreatment, reverse osmosis, pH adjustment prior the reverse osmosis, sodium, calcium, silica sulfate carbonate and TOC are also remove by the process (table I, columns 7-8). It would have been obvious to ne skilled in the pertinent art to produce water with he same quality by treating the water at the same

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pH and by reverse osmosis as suggested by '185. Reference '185 discloses a substantial removal of contaminants from the feed water, including high TOC, silica, boron, alkalinity and hardness ions. Producing water of higher purity should have been obvious to one skilled in the art at the time the invention was made, e.g. by duplicating the process (providing additional membranes).

Response to Amendment

5. **Response to Applicant's Remarks:** the discussion below respond to arguments in paper No.16, filed on 4/24/02).

With respect of arguments about Collentro 's references , claims 37 and 38 are only directed to a "low solute containing water", which limitation is met by reference '479, which produces water with a resistivity of 10 megohm-cm. Regarding the TOC content of the water product, this is also met by the degree of purity of the water produced by '479; '479 discloses removing organic matter (causing TOC), by pretreatment with nanofiltration and activated carbon(column 6, lines 10-47), the NF having pore size as low as 0.008 micron, and the total pretreatment produces a water to be treated in the first reverse osmosis membrane having a total dissolved solids as low as 4.5 ppm, since total organic carbon is part of the total organic solid content in the water, it would have been obvious to one skilled in the art at the time the invention was made to expect the final water produced from the last RO stage to have TOC levels within the levels claimed by Applicant.

Reference '053 also teaches the bacteria and TOC levels claimed, where a total organic carbon of less than 500 ppb is disclosed (column 9, lines 24-39). A total dissolved solids in the range of 0-

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300 ppm in the product water is also disclosed (column 10, lines 34-37), for a resistivity of 2-4 megohm. Therefore, the TOC level in water with higher degree of purity, e.g. 10 megohm, as in '479 should be less than 500 ppb, which is lower than the claimed values in present application.

In response to arguments directed to the rate of removal of the different impurities by the process producing the claimed **water** product, the ways of determining allowability of a product by process claims is discussed in the MPEP, section 2113 related case law are also discussed, and are attached.

Product by process claims are products.

The invention defined by a product-by-process claims IS a product, NOT a process. In re Bridgeford, 357 F2d 679; 149 USPQ 55 (CCPA 1996). It is the patentability of the product claimed and NOT of the recited process steps which must be established. In re Brown, 459 F2d 531; 173 USPQ 685(CCPA 1976). A comparison of the recited process steps with the prior art processes does NOT serve to result the issue concerning the patentability of the product. In re Fessman, 489 F2d 742; 180 USPQ 324 (CCPA 1974).

Applicant argues that Bhavé et al does not teach the percentages with respect to the feed water; the claims in the present invention are directed to "product water with low solute", and only the percentage of TOC, Boron, silica, etc. are claimed as part of the process or producing the product and its removal rate and not as final composition that distinguish from the prior art of record. ion. As mention in the case law above, the process step, in this particular case does not define the

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product, and the product, having the same properties can be made by other processes, as disclosed in the prior art of record discussed above.

The same arguments with respect to Caloundra's references and Bhavé et al, applied to references to Abe and Tao respectively. The rejections are maintained, Applicant's fails to provide concrete evidence of an unobvious difference between the product claimed in the present invention and the product of the above discussed references. Applicant fails to show, for example that water having the resistivity disclosed in Caloundra's references, and in Bhavé et al (10 and 18.2 respectively) are inferior in the components claimed in the water (product) claimed in the present invention. Furthermore, Applicant discloses producing water with a resistivity of 18.2 megaohm-cm (page 56, lines 33-26), in which additional process steps are required to reach such high level of purity (which is not claimed).

6. References on IDS of 4/24/02 have been considered by the Examiner. A signed copy of Form-1449 is attached.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana Fortuna whose telephone number is (703) 308-3857. The examiner can normally be reached on Monday-Friday from 9:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda Walker, can be reached on (703) 308-0457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310 for regular responses, and (703)872-9311 for after finals.



ANA FORTUNA
PRIMARY EXAMINER

Ana Fortuna

June 7, 2002